



Analytical Methods Approved for Compliance Monitoring under the Enhanced Surface Water Treatment Rule

Analysis for the following contaminants shall be conducted in accordance with the methods in the following table or their equivalent as determined by EPA. The methods and monitoring requirements for these contaminants are specified in 40 CFR 141.74. Additional methods are listed in Appendix A to Subpart C of Part 141.

The CFR is the legal reference for approved methods and takes precedent over this table. The table should accurately reflect the analytical methods information published in 40 CFR 141. If you find discrepancies, please notify The Safe Drinking Water Hotline (800-426-4791) so that EPA can correct the table.

| Contaminant | | | | EPA Publication Number | Publication Order Number | Source of Method |
|----------------------|-------------------------|---|------|------------------------|--------------------------|---|
| Method | Organization | Reference Title | Date | | | |
| Disinfectants | | | | | | |
| Free Chlorine | | <p>If approved by the State, residual disinfectant concentrations for free chlorine and combined chlorine may be measured using DPD colorimetric test kits.</p> <p>If approved by the State, free chlorine may be measured using ITS free chlorine test strips. Use of the test strips is described in Method D99-003, "Free Chlorine Species (HOCl- and OCl-) by Test Strip," Revision 3.0, November 21, 2003, available from Industrial Test Systems, Inc., 1875 Langston St., Rock Hill, SC 29730.</p> | | | | |
| 4500-Cl D | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 18th Edition | 1992 | | | Standard Methods |
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Disinfectants

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| <i>Disinfectants</i> | | | | | | |
| <div>Chlorine Dioxide</div> | | | | | | |
| 327 Rev 1.1 | EPA | Determination of Chlorine Dioxide and Chlorite Ion in Drinking Water Using Lissamine Green B and Horseradish Peroxidase with Detection by Visible Spectrophotometry | May 2005 | EPA 815-R-05-008 | | http://www.epa.gov/safewater/methods/sourcalt.html |
| 4500-ClO2 C | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 18th Edition | 1992 | | | Standard Methods |
| 4500-ClO2 C | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 19th Edition | 1995 | | | Standard Methods |
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| Ozone | | | | | | |
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Disinfectants

Ozone

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Microbial Contaminants

Total Coliforms

The time from sample collection to initiation of analysis may not exceed 8 hours. Systems must hold samples below 10°C during transit.

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| 9221 A | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 18th Edition | 1992 | | Standard Methods | |
| <p>No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.</p> <p>Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between this medium and lauryl tryptose broth using the water normally tested, and this comparison demonstrates that the false-positive rate and false-negative rate for total coliform, using lactose broth, is less than 10 percent.</p> <p>Media should cover inverted tubes at least one-half to two-thirds after the sample is added.</p> | | | | | | |
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| <p>MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and <i>Escherichia coli</i> in water" by Brenner, K.P., <i>et al.</i>, 1993, Appl. Environ. Microbiol. 59:3534-3544. EPA/600/J-99/225. Available at: http://www.epa.gov/nerlcwww/online.htm. Verification of colonies is not required.</p> <p>Coliscan® is approved as a modification of MI under the ATP program. It is available from Micrology Laboratories, P.O. Box 340, Goshen, IN 46527-0340.</p> | | | | | | |
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| 9222 A | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 20th Edition | 1998 | | | Standard Methods |
| <p>MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and <i>Escherichia coli</i> in water" by Brenner, K.P., <i>et al.</i>, 1993, Appl. Environ. Microbiol. 59:3534-3544. EPA/600/J-99/225. Available at: http://www.epa.gov/nerlcwww/online.htm. Verification of colonies is not required.</p> <p>Coliscan® is approved as a modification of MI under the ATP program. It is available from Micrology Laboratories, P.O. Box 340, Goshen, IN 46527-0340.</p> | | | | | | |
| 9222 A | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 21st Edition | 2005 | | | Standard Methods |
| <p>MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and <i>Escherichia coli</i> in water" by Brenner, K.P., <i>et al.</i>, 1993, Appl. Environ. Microbiol. 59:3534-3544. EPA/600/J-99/225. Available at: http://www.epa.gov/nerlcwww/online.htm. Verification of colonies is not required.</p> <p>Coliscan® is approved as a modification of MI under the ATP program. It is available from Micrology Laboratories, P.O. Box 340, Goshen, IN 46527-0340.</p> | | | | | | |

| Contaminant | | | | EPA Publication Number | Publication Order Number | Source of Method |
|-------------|--------------|-----------------|------|------------------------|--------------------------|------------------|
| Method | Organization | Reference Title | Date | | | |

Total Coliforms

The time from sample collection to initiation of analysis may not exceed 8 hours. Systems must hold samples below 10°C during transit.

| | | | | | |
|-----------|-------------------------|--|------|--|---|
| 9222 A-97 | Standard Methods Online | <p>Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved.</p> <p>MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and <i>Escherichia coli</i> in water" by Brenner, K.P., <i>et al.</i>, 1993, Appl. Environ. Microbiol. 59:3534-3544. EPA/600/J-99/225. Available at: http://www.epa.gov/nerlcwww/online.htm. Verification of colonies is not required.</p> <p>Coliscan® is approved as a modification of MI under the ATP program. It is available from Micrology Laboratories, P.O. Box 340, Goshen, IN 46527-0340.</p> | | | http://www.standardmethods.org/ |
| 9222 B | Standard Methods | <p>Standard Methods for the Examination of Water and Wastewater, 18th Edition</p> <p>MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and <i>Escherichia coli</i> in water" by Brenner, K.P., <i>et al.</i>, 1993, Appl. Environ. Microbiol. 59:3534-3544. EPA/600/J-99/225. Available at: http://www.epa.gov/nerlcwww/online.htm. Verification of colonies is not required.</p> <p>Coliscan® is approved as a modification of MI under the ATP program. It is available from Micrology Laboratories, P.O. Box 340, Goshen, IN 46527-0340.</p> | 1992 | | Standard Methods |
| 9222 B | Standard Methods | <p>Standard Methods for the Examination of Water and Wastewater, 19th Edition</p> <p>MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and <i>Escherichia coli</i> in water" by Brenner, K.P., <i>et al.</i>, 1993, Appl. Environ. Microbiol. 59:3534-3544. EPA/600/J-99/225. Available at: http://www.epa.gov/nerlcwww/online.htm. Verification of colonies is not required.</p> <p>Coliscan® is approved as a modification of MI under the ATP program. It is available from Micrology Laboratories, P.O. Box 340, Goshen, IN 46527-0340.</p> | 1995 | | Standard Methods |
| 9222 B | Standard Methods | <p>Standard Methods for the Examination of Water and Wastewater, 20th Edition</p> <p>MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and <i>Escherichia coli</i> in water" by Brenner, K.P., <i>et al.</i>, 1993, Appl. Environ. Microbiol. 59:3534-3544. EPA/600/J-99/225. Available at: http://www.epa.gov/nerlcwww/online.htm. Verification of colonies is not required.</p> <p>Coliscan® is approved as a modification of MI under the ATP program. It is available from Micrology Laboratories, P.O. Box 340, Goshen, IN 46527-0340.</p> | 1998 | | Standard Methods |

| Contaminant | | EPA Publication Number | | Publication Order Number | Source of Method |
|-------------------------------|-------------------------|---|------|--------------------------|---|
| Method | Organization | Reference Title | Date | | |
| Microbial Contaminants | | | | | |
| Total Coliforms | | The time from sample collection to initiation of analysis may not exceed 8 hours. Systems must hold samples below 10°C during transit. | | | |
| 9222 B | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 21st Edition | 2005 | | Standard Methods |
| | | <p>MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and <i>Escherichia coli</i> in water" by Brenner, K.P., <i>et al.</i>, 1993, Appl. Environ. Microbiol. 59:3534-3544. EPA/600/J-99/225. Available at: http://www.epa.gov/nerlcwww/online.htm. Verification of colonies is not required.</p> <p>Coliscan® is approved as a modification of MI under the ATP program. It is available from Micrology Laboratories, P.O. Box 340, Goshen, IN 46527-0340.</p> | | | |
| 9222 B-97 | Standard Methods Online | Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved. | | | http://www.standardmethods.org/ |
| | | <p>MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and <i>Escherichia coli</i> in water" by Brenner, K.P., <i>et al.</i>, 1993, Appl. Environ. Microbiol. 59:3534-3544. EPA/600/J-99/225. Available at: http://www.epa.gov/nerlcwww/online.htm. Verification of colonies is not required.</p> <p>Coliscan® is approved as a modification of MI under the ATP program. It is available from Micrology Laboratories, P.O. Box 340, Goshen, IN 46527-0340.</p> | | | |
| 9222 C | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 18th Edition | 1992 | | Standard Methods |
| | | <p>MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and <i>Escherichia coli</i> in water" by Brenner, K.P., <i>et al.</i>, 1993, Appl. Environ. Microbiol. 59:3534-3544. EPA/600/J-99/225. Available at: http://www.epa.gov/nerlcwww/online.htm. Verification of colonies is not required.</p> <p>Coliscan® is approved as a modification of MI under the ATP program. It is available from Micrology Laboratories, P.O. Box 340, Goshen, IN 46527-0340.</p> | | | |
| 9222 C | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 19th Edition | 1995 | | Standard Methods |
| | | <p>MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and <i>Escherichia coli</i> in water" by Brenner, K.P., <i>et al.</i>, 1993, Appl. Environ. Microbiol. 59:3534-3544. EPA/600/J-99/225. Available at: http://www.epa.gov/nerlcwww/online.htm. Verification of colonies is not required.</p> <p>Coliscan® is approved as a modification of MI under the ATP program. It is available from Micrology Laboratories, P.O. Box 340, Goshen, IN 46527-0340.</p> | | | |

| Contaminant | | | | EPA Publication Number | Publication Order Number | Source of Method |
|-------------|--------------|-----------------|------|------------------------|--------------------------|------------------|
| Method | Organization | Reference Title | Date | | | |

Microbial Contaminants

| | | | | | | |
|---|-------------------------|---|------|--|--|---|
| Total Coliforms | | The time from sample collection to initiation of analysis may not exceed 8 hours. Systems must hold samples below 10°C during transit. | | | | |
| 9222 C | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 20th Edition | 1998 | | | Standard Methods |
| <p>MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and <i>Escherichia coli</i> in water" by Brenner, K.P., <i>et al.</i>, 1993, Appl. Environ. Microbiol. 59:3534-3544. EPA/600/J-99/225. Available at: http://www.epa.gov/nerlcwww/online.htm. Verification of colonies is not required.</p> <p>Coliscan® is approved as a modification of MI under the ATP program. It is available from Micrology Laboratories, P.O. Box 340, Goshen, IN 46527-0340.</p> | | | | | | |
| 9222 C | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 21st Edition | 2005 | | | Standard Methods |
| <p>MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and <i>Escherichia coli</i> in water" by Brenner, K.P., <i>et al.</i>, 1993, Appl. Environ. Microbiol. 59:3534-3544. EPA/600/J-99/225. Available at: http://www.epa.gov/nerlcwww/online.htm. Verification of colonies is not required.</p> <p>Coliscan® is approved as a modification of MI under the ATP program. It is available from Micrology Laboratories, P.O. Box 340, Goshen, IN 46527-0340.</p> | | | | | | |
| 9222 C-97 | Standard Methods Online | Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved. | | | | http://www.standardmethods.org/ |
| <p>MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and <i>Escherichia coli</i> in water" by Brenner, K.P., <i>et al.</i>, 1993, Appl. Environ. Microbiol. 59:3534-3544. EPA/600/J-99/225. Available at: http://www.epa.gov/nerlcwww/online.htm. Verification of colonies is not required.</p> <p>Coliscan® is approved as a modification of MI under the ATP program. It is available from Micrology Laboratories, P.O. Box 340, Goshen, IN 46527-0340.</p> | | | | | | |
| 9223 | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 18th Edition | 1992 | | | Standard Methods |
| The ONPG-MUG Test is also known as the Autoanalysis Colilert System. | | | | | | |
| 9223 | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 19th Edition | 1995 | | | Standard Methods |
| The ONPG-MUG Test is also known as the Autoanalysis Colilert System. | | | | | | |

| Contaminant | | Reference Title | Date | EPA Publication Number | Publication Order Number | Source of Method |
|-------------|--------------|-----------------|------|------------------------|--------------------------|------------------|
| Method | Organization | | | | | |

Microbial Contaminants

| | | | | | | |
|--|-------------------------|---|------|--|--|---|
| Total Coliforms | | The time from sample collection to initiation of analysis may not exceed 8 hours. Systems must hold samples below 10°C during transit. | | | | |
| 9223 | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 20th Edition | 1998 | | | Standard Methods |
| The ONPG-MUG Test is also known as the Autoanalysis Colilert System. | | | | | | |
| 9223 | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 21st Edition | 2005 | | | Standard Methods |
| The ONPG-MUG Test is also known as the Autoanalysis Colilert System. | | | | | | |
| 9223 B-97 | Standard Methods Online | Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved. | | | | http://www.standardmethods.org/ |
| The ONPG-MUG Test is also known as the Autoanalysis Colilert System. | | | | | | |

| | | | | | | |
|---|------------------|--|------|--|--|------------------|
| Fecal Coliforms | | The time from sample collection to initiation of analysis may not exceed 8 hours. Systems must hold samples below 10°C during transit. | | | | |
| 9221 E | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 18th Edition | 1992 | | | Standard Methods |
| A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C. | | | | | | |
| 9221 E | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 19th Edition | 1995 | | | Standard Methods |
| A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C. | | | | | | |
| 9221 E | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 20th Edition | 1998 | | | Standard Methods |
| A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C. | | | | | | |
| 9221 E | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 21st Edition | 2005 | | | Standard Methods |
| A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C. | | | | | | |

| Contaminant | | | | EPA Publication Number | Publication Order Number | Source of Method |
|-------------|--------------|-----------------|------|------------------------|--------------------------|------------------|
| Method | Organization | Reference Title | Date | | | |

Microbial Contaminants

Fecal Coliforms

The time from sample collection to initiation of analysis may not exceed 8 hours. Systems must hold samples below 10°C during transit.

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|-----------|-------------------------|---|------|--|---|
| 9221 E-99 | Standard Methods Online | Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved. | | | http://www.standardmethods.org/ |
| | | A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C. | | | |
| 9222 D | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 18th Edition | 1992 | | Standard Methods |
| 9222 D | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 19th Edition | 1995 | | Standard Methods |
| 9222 D | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 20th Edition | 1998 | | Standard Methods |
| 9222 D | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 21st Edition | 2005 | | Standard Methods |
| 9222 D-97 | Standard Methods Online | Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved. | | | http://www.standardmethods.org/ |

Heterotrophic Bacteria

The time from sample collection to initiation of analysis may not exceed 8 hours. Systems must hold samples below 10°C during transit.

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|--------|------------------|--|------|--|------------------|
| 9215 B | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 18th Edition | 1992 | | Standard Methods |
| 9215 B | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 19th Edition | 1995 | | Standard Methods |

| Contaminant | | | | EPA Publication Number | Publication Order Number | Source of Method |
|-------------|--------------|-----------------|------|------------------------------|--------------------------------|------------------|
| Method | Organization | Reference Title | Date | | | |

Microbial Contaminants

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|-------------------------------|--------------------------|---|---------------|--|--|---|
| Heterotrophic Bacteria | | The time from sample collection to initiation of analysis may not exceed 8 hours. Systems must hold samples below 10°C during transit. | | | | |
| 9215 B | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 20th Edition | 1998 | | | Standard Methods |
| 9215 B | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 21st Edition | 2005 | | | Standard Methods |
| 9215 B-00 | Standard Methods Online | Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved. | | | | http://www.standardmethods.org/ |
| SimPlate® | IDEXX Laboratories, Inc. | IDEXX SimPlate TM HPC Test Method for Heterotrophs in Water | November 2000 | | | IDEXX Laboratories, Inc. |

Water Quality Parameters

| | | | | | | |
|------------------|------------------|---|--------------|------------------|-------------|---|
| Turbidity | | Styrene divinyl benzene beads (e.g. AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g. Hach StablCal™ or equivalent) are acceptable substitutes for formazin. | | | | |
| 10133 Rev. 2.0 | Hach Co. | Hach Filter Track Method, "Determination of Turbidity by Laser Nephelometry," Revision 2.0 | January 2000 | | | Hach Company |
| 180.1 Rev 2.0 | EPA | In Methods for the Determination of Inorganic Substances in Environmental Samples | August 1993 | EPA/600/R-93/100 | PB94-120821 | http://www.nemi.gov |
| 2130 B | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 18th Edition | 1992 | | | Standard Methods |

| Contaminant | | Reference Title | Date | EPA Publication Number | Publication Order Number | Source of Method |
|-------------|--------------|-----------------|------|------------------------|--------------------------|------------------|
| Method | Organization | | | | | |

Turbidity

Styrene divinyl benzene beads (e.g. AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g. Hach StablCal™ or equivalent) are acceptable substitutes for formazin.

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|-----------|-------------------------------|---|------------------|--|---|
| 2130 B | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 19th Edition | 1995 | | Standard Methods |
| 2130 B | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 20th Edition | 1998 | | Standard Methods |
| 2130 B | Standard Methods | Standard Methods for the Examination of Water and Wastewater, 21st Edition | 2005 | | Standard Methods |
| 2130 B-01 | Standard Methods Online | Online version of Standard Methods for the Examination of Water and Wastewater. Approval year by Standard Methods Committee is designated by last 2 digits. This is the only online version that is approved. | | | http://www.standardmethods.org/ |
| Method 2 | Great Lakes Instruments, Inc. | GLI Method 2, "Turbidity" | November 2, 1992 | | Great Lakes Instruments, Inc. |

Contact information for methods that are not available on the Internet are summarized in the report titled "Sources of Approved Analytical Methods for National Drinking Water Regulations."